CLAIMS

1. A solid-state color image pickup apparatus comprising:

a solid-state image pickup device being provided with;

a color separation filter having one arrangement pattern comprising four pixels adjoining vertically and horizontally, said color separation filter of this arrangement pattern comprising two whole-color-pass filters corresponding to two pixels, a cyan-pass filter corresponding to one pixel, and a yellow-pass filter corresponding to one pixel, and repeating the arrangement pattern in the vertical and horizontal directions, and

means for separately taking data corresponding to each pixel of the color separation filter, and

a signal processing circuit for taking four luminance signals and two kinds of color-difference signals, for one of the arrangement patterns, from each pixel data taken out of the solid-state image pickup device; at this time, said signal processing circuit generating two of the four luminance signals by using only the data from the whole-color-pass filters, and generating the remaining two luminance signals by using the data from the whole-color-pass filters and the data of peripheral pixels in the vicinity of the four pixels adjoining vertically and horizontally, and generating the two kinds of color-difference signals by using the data from the cyan or yellow-

pass filter and the data from the peripheral pixels.

2. A solid-state color image pickup apparatus as defined in Claim 1, wherein said color separation filter having one arrangement pattern comprising vertically and horizontally adjoining four pixels is constituted such that the four pixels are vertical two pixels × horizontal two pixels, and six signals comprising four luminance signals and two kinds of color-difference signals are generated from the data taken out of this arrangement pattern, and the six signals so generated are output to a device of 4:2:0 format.

3. A solid-state color image pickup apparatus as defined in Claim 1, wherein said color separation filter having one arrangement pattern comprising vertically and horizontally adjoining four pixels is constituted such that the four pixels are vertical one pixel × horizontal four pixels, and six signals comprising four luminance signals and two kinds of color-difference signals are generated from the data taken out of the arrangement pattern, and the six signals so generated are output to a device of 4:1:1 format.

4. A solid-state color image pickup apparatus as defined in Claim 1:

wherein said color separation filter having one arrangement

pattern comprising vertically and horizontally adjoining four pixels, comprises a whole-color-pass filter and a cyan-pass filter for the upper two pixels from the left, and a yellow-pass filter and a whole-color-pass filter for the lower two pixels from the left; and

said apparatus further comprising:

storage means for capturing a chrominance signal outputted from each pixel of the solid-state image pickup device, and storing it;

correlation calculation means for calculating the correlation between a target pixel to be interpolated and plural pixels in the vicinity of the target pixel, said target pixel being any of a cyan signal pixel and a yellow signal pixel stored in the storage means; and

interpolation means for interpolating the target pixel in a direction along which the calculated correlation is relatively large, and calculating a whole-color-pass signal in the position of the target pixel.

5. A solid-state color image pickup apparatus as defined in Claim 4, wherein said correlation calculation means calculates the correlation between the target pixel and the pixels in the vicinity of the target pixel, including the target pixel, in the horizontal or vertical direction.

6. A solid-state color image pickup apparatus as defined in Claim 4, wherein said correlation calculation means calculates the correlation between the target pixel and the pixels in the vicinity of the target pixel, including the target pixel, in the horizontal or vertical direction and, further, in the diagonal direction.

7. A solid-state color image pickup apparatus as defined in Claim 4, wherein said correlation calculation means calculates the correlation between the target pixel and the pixels in the vicinity of the target pixel, including the target pixel, in the horizontal or vertical direction and, further, in the upper right direction, or lower right direction, or upper left direction, or lower left direction.

8. A solid-state color image pickup apparatus as defined in Claim 4, wherein said correlation calculation means calculates the correlation between the target pixel and the pixels in the vicinity of the target pixel, including the target pixel, in the horizontal or vertical direction, and in the diagonal direction, and further, in the upper right direction, or lower right direction, or upper left direction, or lower left direction.

9. A solid-state color image pickup apparatus as defined in Claim 4, wherein said correlation calculation means calculates

the correlation by performing operation on signals of the same color, between the target pixel and the pixels in the vicinity of the target pixel.

10. A solid-state color image pickup apparatus as defined in Claim 4, wherein said correlation calculation means calculates the correlation by performing operation on adjacent pixels being signals of different colors, between the target pixel and the pixels in the vicinity of the target pixel.

11. A solid-state color image pickup apparatus as defined in Claim 4, wherein said interpolation means performs interpolation using only signals of the same color as that of a chrominance signal to be generated, in the vicinity of the target pixel, without using the chrominance signal of the target pixel in the direction where the correlation calculated by the correlation calculation means is relatively large.

12. A solid-state color image pickup apparatus as defined in Claim 4, wherein said interpolation means calculates a shortage of a chrominance signal to be generated, from the pixels in the vicinity of the target pixel, using the chrominance signal of the target pixel in the direction where the correlation calculated by the correlation calculation means is relatively large, and performs interpolation on the shortage.

13. A solid-state color image pickup apparatus as defined in any of Claims 5 to 10 wherein, when the correlation calculated by the correlation calculation means is smaller than a given threshold, said interpolation means reduces the gain of the color-difference signal corresponding to the pixel.

14. A solid-state color image pickup apparatus as defined in any of Claims 5 to 10 wherein, when the correlation calculated by the correlation calculation means is smaller than a given threshold, said interpolation means reduces the gain of the color-difference signal corresponding to the pixel, stepwise, according to the correlation.

15. A solid-state color image pickup apparatus as defined in Claim 4, wherein said interpolation means is provided with frequency characteristic adjustment means for adjusting the frequency characteristic of each chrominance signal outputted from the solid-state image pickup device, and the interpolation means interpolates and composites a color-difference signal by using the chrominance signal whose frequency characteristic is adjusted.

16. A solid-state color image pickup apparatus as defined in Claim 5, wherein said interpolation means is provided with

frequency characteristic adjustment means for adjusting the frequency characteristic of each chrominance signal outputted from the solid-state image pickup device, and the interpolation means interpolates and composites an R-Y color-difference signal in the position of the cyan-pass filter, and a B-Y color-difference signal in the position of the yellow-pass filter, by using the chrominance signal whose frequency characteristic is adjusted.

17. A solid-state color image pickup apparatus as defined in Claim 15, wherein said interpolation means decides the correlation direction according to the correlation calculated by the correlation calculation means, performs frequency characteristic adjustment when there is a direction where the correlation is relatively large, and does not perform frequency characteristic adjustment when there is no direction where the correlation is relatively large.

18. A solid-state color image pickup apparatus as defined in Claim 16, wherein said interpolation means decides the correlation direction according to the correlation calculated by the correlation calculation means, performs frequency characteristic adjustment when there is a direction where the correlation is relatively large, and does not perform frequency characteristic adjustment when there is no direction where the

correlation is relatively large.